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Running head: STRENGTH-BASED INTERVENTIONS

Strength-based positive interventions: Further evidence for their potential in enhancing well-being and alleviating depression

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Abstract

The impact of nine strengths-based positive interventions on well-being and depression was examined in an Internet-based randomized placebo-controlled study. The aims of the study were to: (1) replicate findings on the effectiveness of the *gratitude visit*, and *three good things*, using character strengths-intervention; (2) test variants of interventions (noting *three good things* for two weeks; combining the *gratitude visit* and *three good things* interventions; and noting *three funny things* for a week); and (3) test the effectiveness of the *counting kindness*, *gift of time*, and another door opens-interventions in an online setting. A total of 622 adults subjected themselves to one of the nine interventions or to a placebo control exercise (*early memories*) and thereafter estimated their degrees of happiness and/or depression at five times (pre- & post-test, one-, three-, and six months follow-up). Eight of the nine interventions increased happiness; depression was decreased in all groups, including the placebo control group. We conclude that happiness can be enhanced through some "strength based" interventions. Possible mechanisms for the effectiveness of the interventions are discussed.

Keywords: positive psychology, well-being, positive interventions, character strengths

Strength-based positive interventions: Further evidence on their potential for enhancing well-being and alleviating depression

Background

To study what is best in people (Seligman & Csikszentmihalyi, 2000) can be seen as a mission statement of positive psychology. Helping people to uncover, explore, and practice their strengths and talents is essential in this approach. *Positive interventions* are "treatment methods or intentional activities aimed at cultivating positive feelings, positive behaviors, or positive cognitions" (Sin & Lyubomirsky, 2009; p. 467). Such deliberate interventions typically focus on increasing well-being and decreasing levels of depression (cf. Lyubomirsky, Sheldon, & Schkade, 2005). Sin and Lyubomirsky (2009) report a meta-analysis of 49 studies supporting the effectiveness of positive interventions. Inasmuch as these interventions are heterogeneous, a variety of working mechanisms have been proposed for their effectiveness. One of these is Fredrickson's (2004) *broaden-and-build* theory of positive emotions, a framework which is also relevant for the present study. The basic idea of this approach that experiencing positive emotions broadens a person's repertoire of action and thought—and that these enhancements, in turn, facilitate well-being.

Despite the evidence for the effectiveness of positive interventions, a comparatively large number of studies in this field are based on small samples of students or on highly specific samples (e.g., victims of domestic violence or victims of traumatic brain injuries). Additionally, only a few studies address long-term effects but deal only with the time spans immediately before and after an intervention. Furthermore, many studies compare only one or a limited number of interventions. Replications or extensions of findings are still rare (cf. Sin & Lyubomirsky, 2010).

In the present study, we aimed at addressing some of these issues by replicating and extending an earlier study, focusing on a non-student sample, and considering long-term effects (up to six months).

Previous Studies

One of the larger studies (Seligman, Steen, Park, & Peterson, 2005) that investigated long-term effects compared multiple groups and was targeted at the general public. Changes in happiness (understood as the "sense of labeling the overall aim of the positive psychology endeavor and referring jointly to positive emotion, engagement, and meaning", p. 413) and depressive symptoms were tested for a time interval of up to six months. Participants were recruited "from visitors to the Web site created for Seligman's (2002) book *Authentic Happiness* by creating a link called «Happiness Exercises»" (p. 415).

A total of 411 participants were randomly assigned to five intervention groups or to a placebo control group (writing about early memories for a week). The participants self-administered the interventions for one week (or longer if they continued to practice), and completed questionnaires to measure their degrees of happiness and depression at six time points (pretest, posttest directly after the intervention, after one week / one month / three months / six months). Subjects who employed three of the tested interventions (i.e., making a "gratitude visit"; writing about "three good things" that people experienced each day; and identifying and using "signature strengths[1]" in a new way) demonstrated an increase in happiness and an alleviation of depressive symptoms compared to the placebo control.

Whereas the effects of the *gratitude visit*-intervention on happiness and depression lasted for one month only, the *three good things* and the *using signature strengths* interventions led to positive changes up to six months after the intervention.

Although Seligman et al. (2005) reported that participants who continued practicing exercises beyond the instructed time period benefited most from the interventions (i.e., larger gain in happiness and larger decrease in depressive symptoms), this study has not yet been replicated. It is also not known whether or not the interventions are applicable in other cultural contexts. Furthermore, the participants in the Seligman et al. study were presumably highly

motivated to increase their degrees of happiness due to the advertisement of the program as "happiness exercises."

Mitchell, Stanimirovic, Klein, and Vella-Brodrick (2009) conducted a similar study of signature strengths-interventions. They reported an increase in subjective well-being (using the Personal Well-Being Index – Adult Scale; IWG, 2006) when measured three months follow-up, compared to a placebo control, but found no changes in other measures of well-being (i.e., life satisfaction, positive and negative affect). In the original intervention by Seligman et al. (2005) participants' character strengths were assessed with the Values in Action Inventory of Strengths (VIA-IS; Peterson, Park, & Seligman, 2005), and they were instructed to use their top five strengths in a new way. Mitchell et al. (2009) used a variation of this paradigm and instructed their participants to choose their perceived top three strengths from a list. Participants were then instructed to share these strengths with a friend and to incorporate them in their daily lives. It seems possible, however, that variations in the designs of the interventions in this study and the instruments employed may have influenced the reported findings. This study also did not include a follow-up period 6 months after the intervention and thus effects for this time period cannot be compared with those reported by Seligman and colleagues (2005).

Although the Seligman et al. (2005) study as a whole has not been replicated, interventions derived from this study have been successfully implemented in other research endeavors and in practice; e.g., in schools (Seligman, Ernst, Gillham, Reivich, & Linkins, 2009), or clinical settings (Seligman, Rashid, & Parks, 2006).

The present study had three main objectives; i.e., (1) to replicate the findings of Seligman et al. (2005); (2) to test variants of the interventions; and (3) to test additional interventions. This is also the first study of this kind that involves a German speaking country, thus enabling cross-cultural comparisons with data collected in the U.S.

Replicating and extending Seligman et al. (2005)

In this study using Seligman et al.'s (2005) design, we report changes in the metrics of happiness and depression for nine intervention groups and a placebo control group (see Table 1 for an overview). There is one exception with respect to replicating Seligman's design: For the recruitment of the participants, we advertised the program as "train your strengths" instead of labeling the interventions "happiness exercises." We thus did not suggest or report the existence of beneficial effects of the interventions on happiness reported in earlier studies. By this omission, we were able to test whether or not (a) the findings of Seligman and colleagues could be replicated and also (b) whether or not the interventions were also effective, even when claims to the facilitation of happiness were lacking.

In order to attempt to replicate the results of the Seligman study, we included the *gratitude visit*, the *three good things*, and the *signature strengths*-intervention, as well as the *early memories* exercise (placebo control) in our study.

Variations of interventions in Seligman et al. (2005)

We tested several variants of interventions described in Seligman et al. (2005). We extended the *duration* of the *three good things*-intervention to two weeks. This was aimed at testing whether "more of the same" had beneficial outcomes or whether more frequent and instructed repetition led to adverse effects (cf. Lyubomirsky et al., 2005). It was not expected that there would necessarily be a linear effect ("twice as good") but we reasoned that the extended duration of the intervention might well lead to more sustainable effects if subjects had extended possibilities of developing a productive habit and spent more time considering positive experiences (i.e., collecting more individual positive memories).

In a second variant we tested the effects of combining the *gratitude visit* with the *three good things*-intervention. Although most studies on positive interventions are based on only one intervention, it seemed reasonable to expect that practicing multiple interventions might increase the effectiveness of an intervention (see also Fordyce, 1977). It was hypothesized that employing

two different techniques with the potential for enhancing happiness and alleviating depression might be more beneficial than using a single technique. It seemed reasonable to ask whether or not the use of two different interventions might not provide the subjects more novelty and interest than working on a single intervention for a longer period of time.

In a third variant, we adapted the *three good things* to the *three funny things*-intervention. Noting three good things and pondering over why those things happened has been shown to be an effective strategy for bolstering well-being (Seligman et al., 2005; and in a similar way, for example, in Emmons & McCullough, 2003, and Froh, Sefick, & Emmons, 2008). It has been argued that this intervention elicits positive emotions and that setting up a diary of positive experiences provides the opportunity of experiencing these emotions again and again when re-reading the diary entries.

This, of course, is not the only possible way of eliciting positive emotions. In this study, we tested whether or not a *humor*-based intervention might have similar effects. Participants assigned to the humor-intervention were asked to note *three funny things* that happened to them over the course of one day and to describe these incidents or situations in more detail. There is stable evidence for a positive relation between humor and several individual indicators of subjective well-being. For example, the humor scale of Peterson and Seligman's (2004) *Values-in-Action Inventory of Strengths* correlated in a robustly positive direction with life satisfaction in a broad range of studies (e.g., Park, Peterson, & Seligman, 2004; Proyer, Gander, Wyss, & Ruch, 2011; Ruch, Proyer, Harzer, Park, Peterson, & Seligman, 2010; Ruch, Proyer, & Weber, 2010). The proposed working mechanism of this effect is that humor induces amusement: an important facet of positive emotions (Ruch, 2009; Güsewell & Ruch, in press). It is argued that amusement may help buffer negative states and experiences and may serve a variety of other positive functions as well (e.g., strengthening in-group bonds; see also Ruch, 1993, 2008). There are also preliminary data that suggest humor-based interventions to be effective in bolstering well-being

(for an overview see Ruch, Rodden, & Proyer, 2011), and there are structured programs for conducting such interventions (McGhee, 2010; see also Proyer, Ruch, & Buschor, in press). It has been argued that the *three good things*-intervention has potential for inducing positive emotions and, based on the literature, the expectation was that this would also be possible via remembering humorous incidents over the course of a day. Overall, parallel effects to the *three good things*-intervention were expected.

Further interventions

We aimed at testing further positive interventions that could be implemented in an online setting. Criteria for the selection of further interventions were: (1) the applicability of the intervention for self-administration in an internet-based study; (2) the relationship of the intervention to one of the character strengths outlined by Peterson and Seligman's (2004) VIA-classification; and (3) the availability of a descriptive instruction for the intervention. Relating the interventions to a character strength provides an additional theoretical framework on possible working mechanisms (cf. Peterson & Seligman, 2004). On these bases, three further interventions were included; namely, (a) the *counting kindness*-intervention by Otake, Shimai, Tanaka-Matsumi, Otsui, and Fredrickson (2006); (b) the *one door closes, another door opens*-intervention (Rashid & Anjum, 2008); and (c) the *gift of time*-intervention (Peterson, 2006).

The *kindness intervention* had not—to the best of our knowledge—been applied in a Western study, nor had it been conducted in an online setting nor had its effect been compared with that of a placebo control group. In a study done in Japan Otake et al. (2006) found positive effects (increased life satisfaction) for a time period of one month in their student sample. The *one door closes, another door opens*-intervention addresses the strength of hope, and the *gift of time*-intervention addresses the strength of love. Both of these strengths are strongly correlated with life satisfaction (e.g., Gander, Proyer, Ruch, & Wyss, in press; Park et al., 2004; Proyer et

al., 2011; Ruch et al., 2010). There is also initial evidence from an experimental study for their potential to increase well-being (Proyer et al., in press).

Hypotheses

Our hypotheses for the study-replication groups (see Table 1; IG1, *gratitude visit*; IG2, *three good things*; IG3, *using signature strengths in a new way*) was that these groups would report increased happiness and a decrease in depressive symptoms during time periods similar to those found by Seligman et al. (2005); i.e., over the course of six months for the *three good things* and the *signature strengths* interventions, and for one month for the *gratitude visit*.

The hypothesis for the *counting kindness* (IG7), the *three funny things* (IG6), the *gift of time* (IG8), and (IG9) the *one door closes, another door opens*-interventions were that there would be increases in happiness and decreases in depressive symptoms for a comparatively shorter period of time (one month). On the basis of findings from similar studies, increases over a longer period of time (up to six months) were expected for the *three good things in two weeks* (IG4) and the combination of *gratitude visit* and *three good things* (IG5). Given the characteristics of the study (self-administration, online, one or two interventions per group), small effects were expected (Sin & Lyubomirsky, 2009).

Method

Participants

Of the 2,374 participants who were assigned to an intervention group 1,598 (67.3%) participants carried out the intervention, and 622 completed all four follow-up assessments (38.9% of the participants who carried out the intervention; see Figure 1). The sample consisted mainly of women (5.4% men), aged 19 to 79 (M = 44.87; SD = 10.07). Most of the participants (61.4%) were living with a partner (76.7% married), 6.3% were in a partnership but lived alone, 17.4% were single, 13.5% were divorced or separated, and 1.4% were widowed. More than half had children (57.6%). The sample was rather well educated: 55.5% of the participants had a

degree from a university or a university of applied sciences, about a fourth had completed vocational training (23.6%) or a school qualification that allowed them to attend university (19.9%), and 1.0% had secondary school education. Most of the participants (80.5%) were employed, 2.6% were currently unemployed, and the remaining 16.9% were students, homemakers, or retirees.

Sample sizes for the replication groups and the placebo control group were $n = 61$ (IG1; 11.5% men), $n = 87$ (IG2; 9.2% men), $n = 73$ (IG3; 19.2% men), and $n = 63$ (PCG; 22.2% men). The sample sizes for the other groups were $n = 64$ (IG4), $n = 60$ (IG5), $n = 55$ (IG6), $n = 62$ (IG7), $n = 55$ (IG8), and $n = 42$ (IG9). The groups did not differ regarding their mean age ($F[9, 612] = 1.74$, $p = .077$), education ($F[9, 612] = 1.75$, $p = .075$), or marital status ($\chi^2[3, N = 284] = 6.42$, $p = .093$). The replication groups did not differ regarding gender ratio ($\chi^2[45, N = 622] = 53.41$, $p = .183$).

Instruments

The *Authentic Happiness Inventory* (AHI, Seligman et al., 2005; in the German version used by Ruch et al., 2010) consists of 33 sets of five statements from which the person has to choose the statement that describes his/her feelings during the past week best. A sample set of statements ranges from "*My life is a bad one*" through "*My life is a wonderful one*". The statements were combined to cover the three dimensions of Seligman's (2002) theory on authentic happiness (i.e., pleasure, engagement, and meaning; Peterson, Park, & Seligman, 2005). We used the AHI since it was also part of the study by Seligman et al. (2005) that we were trying to reproduce. Additionally, it comprehensively measures subtle changes in happiness and reflects the whole range of the happiness continuum (Seligman et al., 2005). The validity of the AHI has been confirmed in several studies (e.g., Schiffrin & Nelson, 2010; Schueller & Seligman, 2010; Shapira & Mongrain, 2010). The alpha coefficient in the present sample was $\alpha = .93$ (pretest).

The *Center for Epidemiologic Studies Depression Scale* (CES-D; Radloff, 1977; in the German adaptation by Hautzinger & Bailer, 1993) is a 20-item measure to assess the presence and duration of depressive symptoms during the past week. It uses a 4-point answer scale from 0 (= "*Rarely or None of the Time [Less than 1 Day]*") to 3 (= "*Most or all of the time [5-7 Days]*"). A sample item is "I thought my life had been a failure." The CES-D was developed to assess a broad range of depressive symptoms in the general population and represents one of the most frequently used depression measures (Shafer, 2006). The alpha coefficient in this sample was α = .92 (pretest).

Design

A randomized placebo controlled trial 10 (groups) × 5 (times) design was used for answering the research questions. Table 1 gives an overview on the interventions that entered the study.

Insert Table 1 about here

Due to the fact that many more women than men participated in the study, all men were randomly assigned to the groups set up to replicate the findings of Seligman et al. (2005); i.e., *gratitude visit* (IG1), *three good things* (IG2), *using signature strengths* (IG3; hereafter called the "replication groups"), and the placebo control group. The other groups consisted of women only.

Procedure

The study follows the same design as that developed by Seligman et al. (2005). The only exception was that we did not collect data for a one-week follow up time period, due to technical difficulties: The server of the institution by which this study was conducted blocked emails that were sent out as a reminder to the participants. Hence, we were unable to reach a substantial

number of participants at this time point. This problem had then been repaired for the subsequent measurement periods.

The inclusion criteria were: (1) a minimum age of 18, (2) neither attending psychotherapeutic treatment throughout the duration of the study, nor using psychotropic or illegal drugs, and (3) regular access to the Internet. An ethics committee approved the study.

The whole study (i.e., participant administration, questionnaire/intervention delivery, and data collection) was conducted via an online platform (http://www.staerkentraining.ch), which was developed following the standards for Internet-delivered testing (Coyne & Bartram, 2006). Collecting data in this way was found to be comparable with traditional data collection methods (Gosling, Vazire, Srivastava, & John, 2004) or even superior, when sensitive information is collected (Turner, Ku, Rogers, Lindberg, Pleck, & Sonenstein, 1998). A possible downside of Internet testing is the relatively high dropout rate (Mitchell, Vella-Brodrick, & Klein, 2010).

Most of the participants in this study were recruited via an article in a women's magazine, but some also through Internet online-advertisement (forums, mailing lists etc.). The study was advertised as an online training program for cultivating character strengths. The procedure is depicted in Figure 1.

Insert Figure 1 about here

After registration, all participants answered basic demographic questions and were randomly assigned to the intervention groups or the placebo control group. Participants completed the AHI and the CES-D before the intervention started. Participants saw an online slide show on the topic of the intervention (e.g., background information on the "psychology of gratitude" or "what are character strengths?"; this took approximately five minutes), and obtained the detailed instruction for their particular intervention afterwards. The intervention had to be

carried out within a week. After carrying out the intervention, participants were instructed to return to the online platform to complete the post-test assessment. Participants received reminder e-mails, asking them to return to the online platform to complete the follow-up assessments.

Participants had the opportunity of contacting researchers via e-mail to obtain technical support. Participants were not paid for their participation in the study, but received individualized feedback on their results via email at the end of the study. Finally, a "manipulation check" question was asked at post-test to assess whether they actually completed the intervention. Only data from participants who indicated that they had completed the assigned intervention were included in the further analyses.

Data analysis

In a first step (preliminary analyses), we tested for differences in initial levels of happiness and depression. We also analyzed the characteristics of participants who dropped out of the study in comparison with those that completed all measurement times. In the next step, we analyzed whether the happiness and depression levels changed at all, as a precondition for further analyses (within-group comparisons). Then, we performed an overall ANOVA (ten groups × five time periods), followed by separate ANOVAs comparing every intervention group with the placebo group (two groups × five time periods). These analyses were performed to ensure the comparability of our findings with those of Seligman et al. (2005). In a final step, we computed planned contrasts, and compared each intervention group with the placebo group at each time period in comparison with the pretest (two groups × two time periods). We based the interpretation of our findings on these planned contrasts, since they allowed for a detailed analysis of each single measurement time.

Results

Preliminary analyses

The analysis of dropouts (participants who carried out the intervention but did not complete all follow-ups[2]) revealed that there were no differences regarding the initial levels of happiness or depression between these two groups. There was a differential dropout rate among the groups ($F[9, 1588] = 4.46, p < .001, \eta^2 = .03$). Post-hoc comparisons showed that the dropout rate was lower in the combination group (IG5) than in all other groups. Furthermore, those participants who completed all assignments were on average 1.7 years older ($F[1, 1596] = 10.84$, $p = .001, \eta^2 = .01$), and there were less men who completed the program (29.7%) than women (39.9%; $F[1, 1596] = 5.85, p = .016, \eta^2 = .004$). Analyses of the initial levels (pretest) of happiness and depressive symptoms indicated no differences among the ten groups that entered the study (AHI: $F[9, 613] = .42, p = .925$; CES-D: $F[9, 613] = 1.44, p = .167$).

Within-group analyses

Means and standard deviations in the AHI and the CES-D for all groups and all time periods are given in Table 2.

Insert Table 2 about here

Table 2 shows that happiness mean levels increased numerically over the course of time in all intervention groups, whereas only subtle changes were observed in the placebo control group. Depressive symptoms decreased numerically in all groups, including the placebo control group. In order to test whether happiness and levels of depression changed at all, repeated measurement ANOVAs were conducted for each group (one condition × five time periods) followed by planned contrasts (every time period compared with pretest). The ANOVAs yielded a significant effect of time on happiness in the expected direction in all groups except for IG4 and the placebo control group (IG1, *gratitude visit*: $F[4, 240] = 4.56, p = .001, \eta^2 = .07$; IG2, *three good things*: $F[4, 344] = 3.60, p = .007, \eta^2 = .04$; IG3, *signature strengths*: $F[4, 288] = 8.92, p <$

.001, η^2 = .11; IG4, *three good things in two weeks*: $F[4, 252] = 1.33$, $p = .259$; IG5, *gratitude visit & three good things*: $F[4, 236] = 4.71$, $p = .001$, $\eta^2 = .07$; IG6, *three funny things*: $F[4, 216] = 4.62$, $p = .001$, $\eta^2 = .08$; IG7, *counting kindness*: $F[4, 244] = 3.44$, $p = .009$, $\eta^2 = .05$; IG8, *gift of time*: $F[4, 216] = 5.38$, $p < .001$, $\eta^2 = .09$; IG9, *one door closes, another door opens*: $F[4, 164] = 5.29$, $p < .001$, $\eta^2 = .11$; PCG, *early memories*: $F[4, 248] = 1.18$, $p = .320$).

For all ANOVAs, planned contrasts were conducted (each time period compared with pretest): Happiness was greater in all groups after one, three, and six months (the exceptions were the comparisons between three months vs. pretest in IG8, and six months vs. pretest in IG2, and IG7; all *n.s.*). Happiness levels at immediate posttest differed only in IG2 from pretest.

All groups except IG8 and IG9 demonstrated a decrease in depressive symptoms over time (IG1: $F[4, 240] = 5.29$, $p < .001$, $\eta^2 = .08$; IG2: $F[4, 344] = 6.19$, $p < .001$, $\eta^2 = .07$; IG3: $F[4, 288] = 8.48$, $p < .001$, $\eta^2 = .11$; IG4: $F[4, 252] = 4.44$, $p = .002$, $\eta^2 = .07$; IG5: $F[4, 236] = 10.21$, $p < .001$, $\eta^2 = .15$; IG6: $F[4, 216] = 9.45$, $p < .001$, $\eta^2 = .15$; IG7: $F[4, 244] = 2.84$, $p = .025$, $\eta^2 = .05$; IG8: $F[4, 216] = 2.38$, $p = .053$, $\eta^2 = .04$; IG9: $F[4, 164] = 1.69$, $p = .155$; PCG: $F[4, 248] = 2.55$, $p = .040$, $\eta^2 = .04$). Planned contrasts showed that all groups (for which significant ANOVA-results were obtained) demonstrated reduced depressive symptoms at immediate posttest and after three months. Further analyses (not shown in detail) indicated that all groups except IG2, IG7, and the PCG also decreased at one month and at six months after the intervention (except for IG2 and IG7).

These first analyses of within-group changes showed that eight out of nine intervention groups succeeded in increasing happiness or decreasing depressive symptoms over time. Unexpectedly, the placebo control group also showed a decrease in depressive symptoms.

Between-group analyses

An overall repeated measurement ANOVA for happiness scores (ten groups × five time periods) revealed significant effects of time ($F[4, 2448] = 30.41, p < .001, \eta^2 = .05$); the group (i.e., type of intervention) × time interaction ($F[36, 2448] = 1.32, p = .097, \eta^2 = .02$) failed to reach significance, and there was no effect for type of intervention ($F[9, 612] = 0.61, p = .789$). For depressive symptoms, a significant effect of time was found ($F[4, 1120] = 41.47, p < .001, \eta^2 = .06$), the condition × time interaction did not reach statistical significance ($F[36, 2448] = 1.20$, $p = .193$), and there was no effect for type of intervention ($F[9, 612] = 0.68, p = .727$). These analyses compared ten groups, of which nine (i.e., the intervention groups) were expected to increase (or decrease), and only one was expected to remain constant (i.e., the placebo control group), thus underestimating a potential effect of the interventions. Therefore, the nonsignificant interaction terms were considered of lesser importance.

To test whether the previously reported within-group changes in the intervention groups exceeded the changes in the placebo control group, each intervention group was compared directly with the placebo control group. For that purpose, repeated measurement analyses of variance (2 conditions × 5 time periods) followed by planned contrasts (condition × time interaction for every time period compared with pretest) were computed for all intervention groups[3]. ANOVA results and planned contrasts are given in Table 3.

Insert Table 3 about here

Table 3 shows that significant effects of time were found for most comparisons of the intervention groups with the placebo control group (PCG) regarding their *happiness* levels, except for the IG2 (*three good things*) and the IG4 (*three good things in two weeks*). The condition × time interaction was significant for the AHI for those assigned to the *using your signature strengths*-intervention (IG3) and for those assigned to the *three funny things*-

intervention (IG6). The interactions in the *three good things*-intervention (IG4) and the *counting kindness*-intervention (IG7) approached significance (*p* between .05 and .10). Planned contrasts showed that happiness increased immediately after the intervention in the IG2, as well as the IG4, and the IG5 (*gratitude visit & three good things)*. One month after the intervention, all groups, except for the IG7 ($p = .07$) and the IG4 ($p = .23$), increased in their mean happiness levels compared with the placebo control group. Three months after the intervention, seven out of nine interventions yielded higher increases in happiness, the exceptions were the IG7 and the IG8 (*gift of time*). Six months after the intervention, the *using signature strengths*-group (IG3) still displayed increased happiness levels compared to the placebo control group.

Regarding *depressive symptoms*, all groups showed a significant effect for time. Only for IG6, a significant condition × time interaction was found. Planned contrasts revealed a significant condition × time interaction for the comparison posttest vs. pretest in IG3, IG5, and IG6. After one month, participants undergoing interventions of *gratitude visit* (IG1), *using signature strengths* (IG3), *three good things in two weeks* (IG4), *gratitude visit & three good things* (IG5), and *three funny things*-group (IG6) reported a reduction of depressive symptoms in comparison with the placebo control group. After three months, the reduction of depressive symptoms in the IG1 and the IG6 still exceeded the reduction in the placebo group. In the IG3 and the IG5, the difference to the placebo control group approached significance (*p* between .05 and .10). Six months after the intervention, depressive symptoms were still lower in the IG3.

The practical significance of the changes in the intervention groups were illustrated by comparing the number of participants scoring above the CES-D's (though highly sensitive) cutoff point of ≥ 16 (Radloff, 1977) at the different time periods: At pretest, 37.0% of the participants in the intervention groups, and 34.9% of the participants in the placebo control group scored equal or higher than 16 (IG1: 32.8%; IG2: 34.5%; IG3: 41.1%; IG4: 34.4%; IG5: 36.7%; IG6: 54.5%; IG7: 33.9%; IG8: 32.7%; IG9: 32.7%). At one month after the intervention, the percentage of

participants scoring above the cutoff point dropped to 25.0% in the intervention groups and to 33.3% in the placebo control group. Additionally, 55.6% of those participants in the intervention groups that were above the cutoff point at pretest were below it one month after the intervention. The proportion of participants whose CES-D scores dropped below the cutoff was numerically higher in each intervention group than in the placebo control group. The percentages ranged from 43% [*counting kindness*] to 68% [*gratitude visit & three good things*] in the intervention group and were 27% in the placebo control group[4].

Although participants were instructed to conduct the interventions for one week and were not explicitly encouraged to continue practicing, some of them did. To test the impact of continued practice, planned contrasts were computed with adherence to the intervention as the independent variable, and the change in happiness and depression scores as the dependent variable[5]. Continued practice yielded higher increases in happiness at one month ($F[1, 333] = 3.49, p = .063, \eta^2 = .01$), three months ($F[1, 333] = 4.17, p = .042, \eta^2 = .01$), and six months after the intervention ($F[1, 333] = 10.20, p = .002, \eta^2 = .03$), compared to those who stopped practicing after one week. There was no effect of adherence to the intervention on depressive symptoms.

Discussion

This study underlines the potential of positive interventions to increase happiness and alleviate depressive symptoms in a time span of six months. All the presented interventions (except for *three good things in two weeks*; IG4) were associated with an increase in happiness and a decrease in depressive symptoms in comparison with the baseline. Compared with a placebo control group, participants' happiness was elevated at at least one time period of measurement by all the interventions (except for IG4) with small to medium effect sizes.

The findings of Seligman et al. (2005) were thus replicated in German speaking countries. The exception was the *three good things*-intervention, for which no effects on depressive

symptoms were found. The results were comparable despite subtle changes to the recruitment process (avoidance of the term "happiness program"). It cannot, of course, be ruled out that participants acquired information from the Internet or other sources that helped them uncover the intention of the interventions. However, the study suggests that interventions advertised as getting to know and improving personal strengths yield similar effects compared to interventions advertised as improving happiness.

Results of the variation groups (Table 1) revealed that some variants of existing interventions (*three funny things* and *gratitude visit & three good things*) showed similar effects as the original interventions. The results provided further evidence for the effectiveness of the *counting kindness*-, *gift of time*-, and *one door closes, another door opens*-interventions.

At first glance, there seem to be contradictory results for the three good things intervention. Those participants who were instructed to write down three good things for two weeks (IG4) did not benefit from the intervention, whereas the participants who conducted the exercise for one week (IG2) but continued practicing on their own benefited more than those who stopped practicing after the assigned one-week period. However, the aspect of *voluntarily* working longer on the intervention seems to be crucial. Lyubomirsky et al. (2005) underlined the importance of the optimal timing of an intervention and the possibility that people become bored if an exercise becomes routine, a factor which may negatively affect potentially beneficial effects.

The *three good things*-intervention and the *three funny things*-intervention (IG6) both were potent for enhancing happiness. It is interesting, however, with respect to their antidepressant effect, they lead to different results: an antidepressant effect was only found for the *three funny things*-intervention. This might be due to different working mechanisms behind the intervention: While "good things" might be broader in scope, funny things are expected to relate to an immediate—(inducing amusement) and perhaps more intense—experience of positive

emotions, an experience which may be accompanied by laughter, smiling, and an increased and enduring cheerful mood (see Ruch, 1993, 1997).

Findings for the combination of the *gratitude visit* and the *three good things*-intervention (IG5) did not support the expectation that employing a combination of interventions might result in an incremental increase in happiness. One might argue that the training of two strengths within two weeks leads to a saturation that does not allow for an additional increase due to further practice. Thus, the time lag between pursuing two different interventions seems to play a role for the effectiveness of the interventions. This, however, needs to be tested empirically in a future study.

A crucial question is *why* the positive interventions used in this study boost happiness and alleviate depression? The broaden-and-build theory of positive emotions (Fredrickson, 2004) offers a general framework for interpreting our findings. All interventions aim at eliciting positive emotions, which can facilitate building enduring personal resources. It is not, however, expected that only one general mechanism applies to all interventions: an increase in mindfulness or self-regulation might also help explaining the findings. Mindfulness can be defined as the "state of being attentive to and aware of what is taking place in the present" (Brown & Ryan, 2003; p. 822). One might argue that interventions such as the *three funny things* intervention increase the awareness of humorous occurrences in the daily life, and that this facilitates the experience of positive emotions and has a positive effect on well-being. One might also argue that regularly conducting an exercise increases participants' self-regulating competencies: People are instructed to complete a potentially tedious exercise daily, which only pays off in the long-term and only if it is practiced continually (Proyer et al., in press). This fits well into the description of self-regulation, as given by Peterson and Seligman (2004). Of course, these explanations are not mutually exclusive and can be applied to most of the presented interventions.

Additionally, it needs mentioning that the interventions addressed personality characteristics that are shared by individuals with a high level of life satisfaction (Fordyce, 1977). All interventions can be assigned to a strength of character (e.g., *gratitude visit*, *three good things*—gratitude, *counting kindness*—kindness, etc.). Seligman (2011) and Peterson and Seligman (2004) proposed that the display of certain strengths leads to circumstances, which may have an impact on well-being in a positive way (e.g., displaying the strength of "love" can promote stable relationships, and that these stabilized relationships might, in turn, dampen the impact of distress). There is also preliminary evidence for a causal impact of character strengths on well-being (Proyer et al., in press) and for a positive relationship between applying signature strengths (at work) and positive outcomes (e.g., positive experiences at work or seeing ones work as a calling; Harzer & Ruch, in press; see also Gander et al., in press).

While revising this manuscript, another study was published that aimed at replicating effects for the *three good things* and *using your signature strengths* interventions. Mongrain and Anselmo-Matthews (2012) also included a positive placebo control condition ("positive early memories") and found similar findings for all interventions; namely a boost in happiness; unlike Seligman et al. (2005), however, and in contrast with this present study, they did not report effects for the lightening of depression. It should be noted that their sample scored on average higher in the CES-D than the cut-off for depression, thus impeding the comparability. The authors concluded that "positive psychology interventions may boost happiness through a common factor involving the activation of positive, self-relevant information rather than through other specific mechanisms" (p. 382). Our results do not fully support this, since we found different effects for different exercises, an observation which suggests that there are also unique factors in the exercises.

A remaining question concerns the ways in which participants completed the intervention. Participants were asked whether or not they had completed the assigned exercise, but it is not

fully known what they actually did. Exploring this question further can lead to a deeper understanding of why and under what circumstances positive interventions are effective. Whether or not the effectiveness of the interventions depends on the presence of certain personality characteristics in the tested person (e.g., interventions for extraverts vs. introverts; see Senf & Liau, in press) is also of interest. If this proved to be the case it could help properly tailor specific interventions to individual recipients in order to increase intervention effectiveness and to reduce dropout rates.

Limitations

Findings are based on a convenience sample, which consisted largely of females and demonstrated increased scores in depressive symptoms. These peculiarities might be a result of the strategy employed for generating participants (i.e., advertisement in a women's magazine, and addressing people interested in strengthening their strengths). In comparison with Seligman et al. (2005), the dropout rate was higher in this study. Also, we found a reduction in depressive symptoms in the placebo group. Although the participants did not apply for a "happiness program," they were interested in working on their strengths, which might account for the increased CES-D scores. Hence, findings for the variation groups should be replicated with a less depressed, more gender-balanced sample.

The dropout rate in this study was 61.1%, which is comparable to other Online-studies (e.g., Abbott, Klein, Hamilton, & Rosenthal, 2009; Mitchell et al., 2009; Mitchell et al., 2010; Shapira & Mongrain, 2010). The dropout in the present study can be mainly explained by the introduction of strict time slots for completing the assessments (e.g., two days for the pre- and the posttest): Participants that failed to punctually complete a follow-up were excluded from the study. In upcoming studies, we intend to allow for a more flexibility in the completion of the assessments in order to reduce dropout rates.

Finally, the present study examined the effects of the interventions on self-reported happiness, which represents only one global component of well-being. Future studies should include further elements of well-being (e.g., life satisfaction, or positive affect), area-specific well-being (e.g., job, family, leisure, etc.; Diener, Suh, Lucas, & Smith, 1999), but also should rely on assessment methods other than self-reports alone (e.g., peer-reports, interviews, "objective" outcomes, etc.). Future intervention studies should also target other strengths included in the VIA-classification (e.g., curiosity, love), address different orientations to a good life (as described in Peterson et al., 2005; Seligman, 2011), or address other strategies that aim to increase happiness (Tkach & Lyubomirsky, 2006).

Conclusion

(1) Happiness and depressive symptoms can be changed in the desired directions through a variety of positive interventions; (2) as the first replication of the Seligman et al. (2005) study in a non-English speaking sample, our results yield an indication of the cross-cultural validity of Seligman et al.'s hypotheses; (3) these interventions also work if the participants are not informed about the expected beneficial impact of the interventions; (4) continued practice is important for success in the intervention, but only if conducted voluntarily; and (5) individual interventions demonstrated individual effects on happiness and depression.

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Footnotes

[1] Signature strengths are those strengths that are typical for a person and that truly represent the strengths-constitution of a person; they are pursued on the basis of intrinsic motivation. It is assumed that people typically possess between three and seven signature strengths (Peterson & Seligman, 2004).

[2] Results were highly similar if dropouts were computed on the basis of those participants who were assigned to an intervention group.

[3] Overall repeated measurement analyses of variance with gender as independent variable and happiness or depressive symptoms as dependents variables yielded no interaction effect between gender and time (AHI: $F[4, 2480] = 0.58, p = 68$; CES-D: $F[4, 2480] = 0.31, p = .87$). Therefore, we did not control for gender or exclude the males from the placebo control group in comparisons with groups that consisted only of female participants.

[4] Comparing the number of participants who improved from above to below the cutoff in each group separately with the placebo control group via a Chi-square test yielded seven out of nine comparisons significant (exceptions were IG2, and IG7).

[5] Comparing the participants who conducted the interventions only for one week ($n = 133$) to those who indicated on every follow-up that they continued with the intervention before each follow-up ($n = 202$).

Table 1

Descriptions of the Nine Intervention Groups and the Placebo Control Exercise.

Label	Intervention	Instruction	Source
		Replication Groups	
IG1	Gratitude visit	Participants were instructed to write and deliver a letter of gratitude to a person they were grateful to, but whom they had never thanked appropriately.	Seligman et al. (2005)
IG2	Three good things	Participants were instructed to write down three things that had gone well for them and an explanation why those things happened; they did this every day for one week.	Seligman et al. (2005)
IG3	Using signature strengths in a new way	Participants in this group received individualized feedback on their top five character strengths and were instructed to use one of their top five strengths in a new way every day for one week.	Seligman et al. (2005)
		Variations of Replication Groups	
IG4	Three good things in two weeks	Participants were instructed to write down three things that went well and an explanation why those things happened to them on every day for two weeks.	Seligman et al. (2005)
IG5	Gratitude visit & three good things	Participants were instructed to write and deliver a gratitude letter in the first week, and to write down three things that went well and an explanation why those things happened to them, on every day in the second week	Seligman et al. (2005)
IG6	Three funny things	Participants were instructed to write down the three funniest things they experienced or did and an explanation why those things happened to them on every day for one week. (The instruction was a variation of the intervention in IG2)	derived from IG2
		Further Intervention Groups	
IG7	Counting kindness	Participants were instructed to count and report the acts of kindness they performed on every day for one week.	Otake et al. (2006)
IG8	Gift of time	Participants were instructed to offer at least three "gifts of time" by contacting/meeting three persons about whom they care in a week (these meetings should have been additional to their planned activities for the week).	Peterson (2006)
IG9	One door closes, another door opens	Participants were instructed to write about a moment in their lives when a negative event led to unforeseen positive consequences on every day for one week.	Rashid & Anjum (2008)
		Placebo Control Group	
PCG	Early memories	Participants were instructed to write down something from their early memories, every day for one week.	Seligman et al. (2005)

Note. IG = Intervention group. PCG = Placebo control group.

Table 2

Means and Standard Deviations of the Ten Groups at the Five Time Periods for Happiness and Depressive Symptoms.

		Pre		Post		1 M		3 M		6 M	
	N	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Happiness											
IG1	61	100.82	16.55	100.28	16.14	103.78	16.96	105.23	18.31	105.26	17.44
IG2	87	97.53	17.78	99.57	15.78	99.91	18.83	102.78	20.69	99.94	21.12
IG3	73	98.97	20.63	100.36	19.16	104.48	23.18	104.44	23.00	107.27	22.47
IG4	64	100.41	18.39	102.52	17.66	101.86	20.10	103.53	20.38	104.06	21.54
IG5	60	101.78	15.85	103.33	14.57	104.80	16.28	107.40	16.30	106.18	17.85
IG6	55	98.16	17.06	98.29	16.68	102.04	17.33	105.29	22.24	102.29	22.34
IG7	62	101.71	17.70	100.65	16.11	105.10	17.93	107.31	18.95	104.08	18.33
IG8	55	99.44	18.55	98.45	18.35	102.07	19.14	102.36	20.40	106.36	20.33
IG9	42	100.07	16.29	99.64	17.09	104.93	18.54	104.43	20.32	105.62	20.43
PCG	63	99.84	16.57	98.71	15.05	98.89	16.92	99.67	18.89	102.00	19.55
Depression											
IG1	61	14.54	11.12	11.21	9.57	10.34	9.86	9.21	7.22	10.46	7.85
IG2	87	13.56	10.48	9.64	8.71	12.67	10.54	10.44	9.84	12.24	9.85
IG3	73	15.86	11.58	10.52	9.42	11.22	10.21	11.15	9.50	11.05	8.75
IG4	64	13.28	11.25	9.38	8.86	9.34	7.98	9.06	8.35	10.38	8.44
IG5	60	13.93	9.20	8.02	6.74	9.97	7.08	9.25	6.51	10.33	8.29
IG6	55	17.87	11.90	10.31	7.62	11.29	10.01	10.64	10.54	13.09	12.36
IG7	62	14.13	8.70	9.94	8.13	13.22	9.80	11.91	10.13	12.89	10.51
IG8	55	13.80	10.85	11.24	9.98	10.60	9.16	10.45	10.05	10.31	10.10
IG9	42	12.43	9.23	8.79	8.99	9.95	7.94	10.21	8.85	9.71	8.64
PCG	63	12.38	9.09	9.44	8.03	11.52	9.42	10.00	7.53	10.54	9.08

Note. Happiness = Authentic Happiness Inventory, Depression = Center for Epidemiologic Studies Depression Scale; IG1 = Gratitude visit, IG2 = Three good things, IG3 = Using signature strengths, IG4 = Three good things in two weeks, IG5 = Combination: Gratitude visit & Three good things, IG6 = Three funny things, IG7 = Counting kindness, IG8 = Gift of time, IG9 = One door closes, another door opens, PCG = Early memories. 1 M = one month after the intervention, 3 M = three months after the intervention, 6 M = six months after the intervention.

Table 3

Repeated Measurement Analysis of Variance on Groups (Intervention group vs. Placebo control Group), and Time Periods (Pretest, Posttest, One Month, Three Months, Six Months) for Happiness and Depressive Symptoms, Followed by Planned Contrasts (Each Posttest vs. Pretest)

		ANOVA									Planned Contrasts (Time × Group)							
		Time			T × G			Group				Post		1 M		3 M		6 M	
	N	*df*	*F*	η^2	*df*	*F*	η^2	*df*	*F*	η^2	*df*	*F*	η^2	*F*	η^2	*F*	η^2	*F*	η^2
Happiness																			
IG1	61	4, 488	3.99**	.03	4, 488	1.48	-	1, 122	1.00	-	1, 122	0.12	-	3.29*	.03	3.24*	.03	1.01	-
IG2	87	4, 592	2.17†	.01	4, 592	2.19†	.01	1, 148	0.00	-	1, 148	4.26*	.03	2.69*	.02	5.56*	.04	0.01	-
IG3	73	4, 536	6.72***	.05	4, 536	2.87*	.02	1, 134	1.13	-	1, 134	2.66	-	8.12**	.06	4.80*	.03	6.16*	.04
IG4	63	4, 500	1.88	-	4, 500	0.63	-	1, 125	0.83	-	1, 125	2.71†	.02	1.47	-	1.77	-	0.36	-
IG5	60	4, 484	3.47**	.03	4, 484	1.82	-	1, 121	3.29†	.03	1, 121	2.46†	.02	3.52*	.03	5.80*	.04	0.75	-
IG6	55	4, 464	3.80**	.03	4, 464	2.58*	.02	1, 116	0.22	-	1, 116	0.49	-	4.16*	.03	6.81**	.05	0.45	-
IG7	62	4, 492	2.84*	.02	4, 492	2.18†	.02	1, 123	2.17	-	1, 123	0.00	-	3.36†	.03	4.27*	.03	0.00	-
IG8	55	4. 464	5.56***	.05	4. 464	1.43	-	1, 116	0.41	-	1, 116	0.01	-	2.87*	.02	1.09	-	2.74†	.02
IG9	42	4, 412	4.21**	.04	4, 412	1.92	-	1, 103	0.95	-	1, 103	0.13	-	6.77**	.06	3.11*	.03	1.53	-
Depression																			
IG1	61	4, 488	6.62***	.05	4, 488	1.72	-	1, 122	0.09	-	1, 122	0.08	-	3.60*	.03	3.03*	.02	1.92	-
IG2	87	4, 592	7.81***	.05	4, 592	0.38	-	1, 148	0.53	-	1, 148	0.80	-	0.00	-	0.27	.	0.12	-
IG3	73	4, 536	9.24***	.06	4, 536	1.76	-	1, 134	0.83	-	1, 134	3.20*	.02	6.14**	.04	1.98†	.01	3.46*	.03

(Table 3 continues)

(Table 3 continued)

		ANOVA									Planned Contrasts (Time × Group)								
		Time			T × G			Group				Post		1 M		3 M		6 M	
	N	*df*	*F*	η^2	*df*	*F*	η^2	*df*	*F*	η^2	*df*	*F*	η^2	*F*	η^2	*F*	η^2	*F*	η^2
IG4	64	4, 500	6.12***	.05	4, 500	1.07	-	1, 125	0.16	-	0.16	0.40	-	4.01*	.03	1.17	-	0.38	-
IG5	60	4, 484	10.68***	.08	4, 484	1.54	-	1, 121	0.17	-	0.17	5.62**	.03	4.05*	.03	2.34†	.02	1.27	-
IG6	55	4, 464	11.21***	.09	4, 464	3.37**	.03	1, 116	1.79	-	1.79	10.70***	.06	10.85***	.07	8.75**	.05	2.09†	.02
IG7	62	4, 492	4.99**	.04	4, 492	0.46	-	1, 123	0.06	-	0.06	0.06	-	0.34	-	0.42	-	0.27	-
IG8	55	4, 464	4.09**	.03	4, 464	0.91	-	1, 116	0.14	-	0.14	0.07	-	1.94†	.02	0.28	-	0.89	-
IG9	42	4, 412	3.85**	.04	4, 412	0.34	-	1, 103	0.18	-	0.18	0.22	-	1.00	-	0.01	-	0.24	-

Note. Happiness = Authentic Happiness Inventory, Depression = Center for Epidemiologic Studies Depression Scale; IG1 = Gratitude visit, IG2 = Three good things, IG3 = Using signature strengths, IG4 = Three good things in two weeks, IG5 = Combination: Gratitude visit & Three good things, IG6 = Three funny things, IG7 = Counting kindness, IG8 = Gift of time, IG9 = One door closes, another door opens, PCG = Early memories; 1 M = one month after the intervention, 3 M = three months after the intervention, 6 M = six months after the intervention, η^2 = Eta squared.

†$p < .10$; *$p < .05$; **$p < .01$; ***$p < .001$ (two-tailed for ANOVAs; one-tailed for planned contrasts).

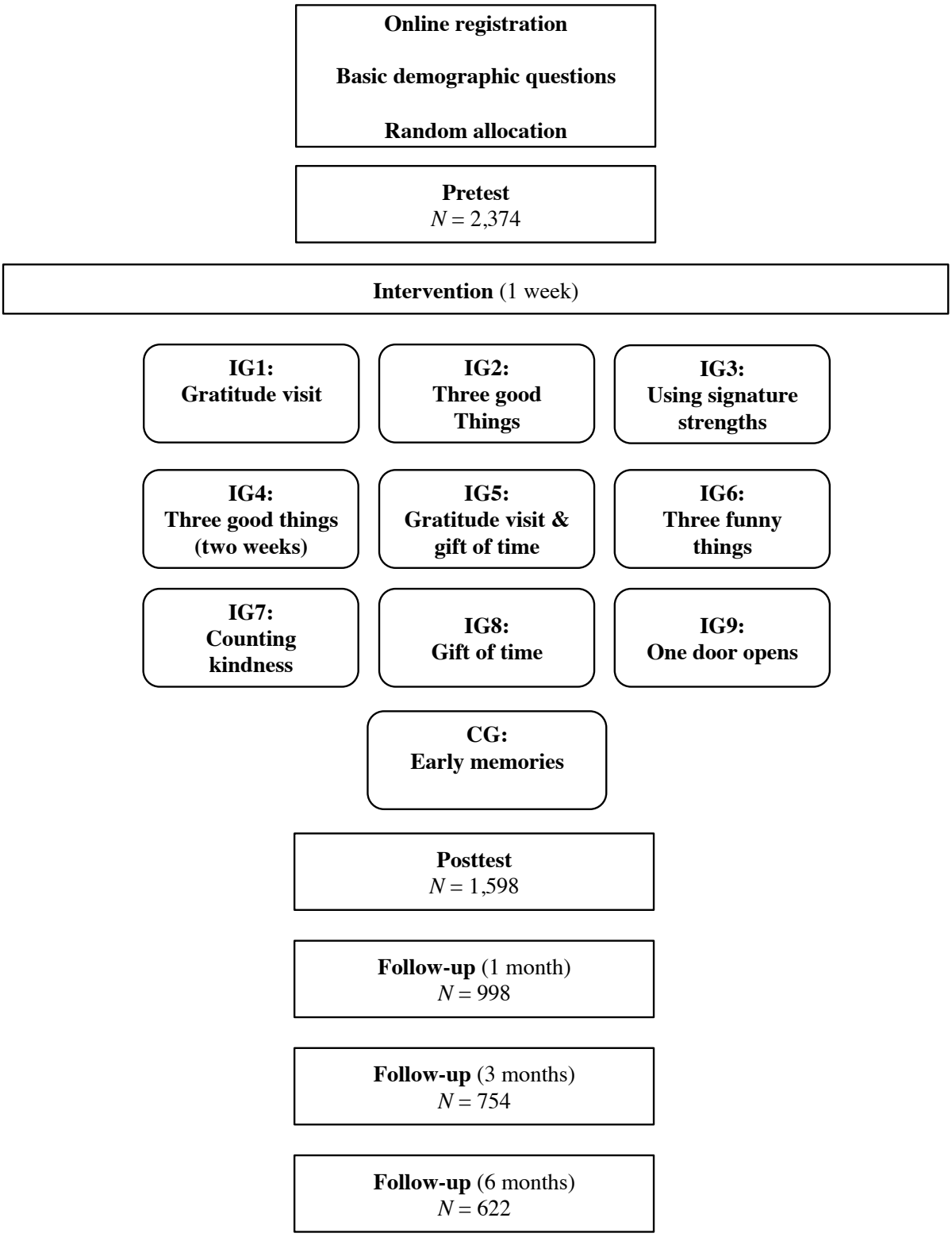

Figure 1. Flowchart of Procedure.